Amendments

In the Claims

Please amend claim 26 as follows:

1. (original ) A method of analyzing fluid in a downhole environment comprising:

a) introducing a fluid sampling tool into a well bore that traverses an earth formation;

b) using the fluid sampling tool to extract the fluid from the earth formation into a flow channel within the tool;

c) monitoring an indication of contamination in the fluid while extracting the fluid from the earth formation and flowing the fluid through the flow channel; and

d) when the indication of contamination in the fluid has stabilized, analyzing the fluid in the flow channel.

2. (original) The method of claim 1, wherein monitoring the indication of contamination comprises performing a magnetic resonance measurement on the fluid in the flow channel.

3. (original) The method of claim 1, wherein the indication of contamination comprises at least one of the following: viscosity, relaxation time, composition, trace element content, diffusion coefficient, proton density, signal amplitude, molecular conformation, and chemical shift.

4. (original) The method of claim 1, wherein analyzing the fluid in the flow channel comprises performing a magnetic resonance measurement on the fluid in the flow channel.

5. (original) The method of claim 1, wherein analyzing the fluid in the flow channel comprises stopping the flow of fluid in the flow channel while performing the magnetic resonance measurement.

6. (original) The method of claim 1, wherein analyzing the fluid in the flow channel comprises slowing the flow of the fluid in the flow channel while performing the magnetic resonance measurement.

7. (original) The method of claim 1, wherein analyzing the fluid in the flow channel comprises continuing the flow of the fluid in the flow channel while performing the magnetic resonance measurement.

8. (original) The method of claim 1, wherein analyzing the fluid in the flow channel comprises determining at least one of the following: fluid volume, diffusion coefficient, relaxation time, proton chemical shift, hydrogen/carbon ratio, viscosity, stock tank API gravity, and fluid composition.

9. (original) A method of analyzing hydrocarbon in a fluid in a downhole environment comprising:

a) introducing a fluid sampling tool into a well bore that traverses an earth formation;

b) using the fluid sampling tool to extract fluid from the earth formation into a flow channel within the tool;

c) applying a static magnetic field to the fluid in the flow channel;

d) applying an oscillating magnetic field at a frequency sensitive to carbon-13 nuclei to the fluid in the flow channel;

e) detecting magnetic resonance signals indicative of carbon-13 nuclei from the fluid; and

f) analyzing the detected magnetic resonance signals to extract information about hydrocarbon in the fluid.

10. (original) The method of claim 9, further comprising stopping the flow of the fluid through the flow channel prior to performing steps (c)-(e).

11. (original) The method of claim 9, wherein the oscillating magnetic field comprises a series of oscillating magnetic field pulses.

12. (original) The method of claim 9, further comprising applying a second oscillating magnetic field at a frequency sensitive to hydrogen nuclei to the fluid in the flow channel.

13. (original) The method of claim 12, wherein analyzing the detected magnetic resonance signals comprises decoupling the second oscillating magnetic field from the detected signals.

14. (original) The method of claim 9, further comprising applying a second oscillating magnetic field at a frequency sensitive to hydrogen-1 nuclei to the fluid in the flow channel and detecting magnetic resonance signals indicative of hydrogen-1 nuclei from the fluid.

15. (original) The method of claim 14, wherein analyzing the detected magnetic resonance signals comprises calculating a hydrogen/carbon ratio.

16. (original) The method of claim 9, wherein analyzing the detected magnetic resonance signals comprises estimating hydrocarbon quantity in the fluid.

17. (original) A method of analyzing water phase fluid in a downhole environment comprising:

a) introducing a fluid sampling tool into a well bore that traverses an earth formation;

b) using the fluid sampling tool to extract fluid from the earth formation into a flow channel within the tool;

c) applying a static magnetic field to the fluid in the flow channel;

d) applying an oscillating magnetic field to the fluid in the flow channel;

e) detecting magnetic resonance signals indicative of nuclei of at least one of the following from the fluid: sodium-23, chlorine-35, chlorine-37, and potassium-39; and

f) analyzing the detected magnetic resonance signals to determine information about the water phase fluid.

18. (original) The method of claim 17, further comprising flowing the fluid through the flow channel and performing steps (c)-(e) while the fluid is flowing.

19. (original) The method of claim 17, wherein the detected magnetic resonance signals are analyzed to determine salinity of the fluid.

20. (original) The method of claim 19, further comprising analyzing the detected magnetic resonance signals to determine water phase resistivity.

21. (original) A method of determining stock tank API gravity of a crude oil sample from downhole fluid analysis comprising:

a) introducing a fluid sampling tool into a well bore that traverses an earth formation;

b) using the fluid sampling tool to extract the crude oil sample from the earth formation;

c) measuring a downhole temperature of the crude oil sample;

d) determining a downhole viscosity of the crude oil sample;

e) determining a downhole gas/oil ratio of the crude oil sample; and

f) correlating the dowhole temperature, viscosity and gas/oil ratio with the stock tank API gravity of the crude oil sample.

22. (original) The method of claim 21, wherein determining the downhole viscosity of the crude oil sample comprises:

i) applying a static magnetic field to the crude oil sample;

ii) applying a sequence of oscillating magnetic field pulses to the crude oil sample;

iii) detecting magnetic resonance signals from the crude oil sample;

iv) determining a relaxation time associated with the crude oil sample; and

v) relating the relaxation time to the downhole viscosity of the crude oil sample.

23. (original) The method of claim 22, wherein determining a relaxation time comprises performing a relaxation time analysis on the detected magnetic resonance signals.

24. (original) The method of claim 22, wherein determining a relaxation time comprises performing a chemical shift analysis on the detected magnetic resonance signals.

25. (original) The method of claim 21, wherein determining the downhole gas/oil ratio of the crude oil sample comprises:

i) transmitting near-infrared light through the crude oil sample;

ii) measuring optical absorption at a first wavelength at which gas absorbs near-infrared light;

iii) measuring optical absorption at a second wavelength at which oil absorbs near-infrared light; and

iv) calculating the downhole gas/oil ratio based on the optical absorptions at the first and second wavelengths.

26. (currently amended) A nuclear magnetic resonance module adapted for incorporation into a fluid sampling tool comprising:

a permanent magnet array adapted to be arranged around a flow line in the fluid sampling tool, wherein the tool includes means for extracting fluid from an earth formation;

a nuclear magnetic resonance antenna adapted to be arranged around the flow line;

means coupled with the antenna for generating an oscillating magnetic field within the flow line; and

means coupled with the antenna for detecting nuclear magnetic resonance signals from the flow line.

27. (original) The nuclear magnetic resonance module of claim 26, wherein the means for generating an oscillating magnetic field comprises means for generating a sequence of oscillating magnetic field pulses.

28. (original) The nuclear magnetic resonance module of claim 26, wherein the means for generating an oscillating magnetic field comprises means for varying the frequency of the oscillating magnetic field.

29. (original) The nuclear magnetic resonance module of claim 28, wherein the means for detecting nuclear magnetic resonance signals comprises means for detecting nuclear magnetic resonance signals from more than one type of nucleus.